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# North Adams Retirement System

## Actuarial Valuation Report

January 1, 2017

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**PUBLIC EMPLOYEE RETIREMENT ADMINISTRATION COMMISSION**  
COMMONWEALTH OF MASSACHUSETTS



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# 1. INTRODUCTION & CERTIFICATION

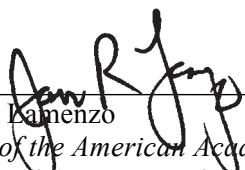
This report presents the results of the actuarial valuation of the North Adams Contributory Retirement System. The valuation was performed as of January 1, 2017 pursuant to Chapter 32 of the General Laws of the Commonwealth of Massachusetts. The actuarial assumptions used in this valuation are the same as those used in the January 1, 2015 valuation except the investment return assumption was reduced from 7.50% to 7.40%.

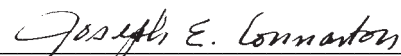
This valuation was based on member data as of December 31, 2016, which was supplied by the Retirement Board. Such tests as we deemed necessary were performed on the data to ensure accuracy. Asset information as of December 31, 2016 was provided in the Annual Statement for the Financial Condition as submitted to this office in accordance with G.L. c. 32, ss. 20(5)(h), 23(1) and 23(2)(e). Both the membership data and financial information were reviewed for reasonableness, but were not audited by us.

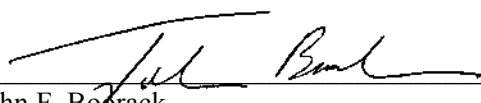
Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions, changes in economic and demographic assumptions, increases or decreases expected as part of natural operation of the methodology used for these measurements such as additional contribution requirements based on the plan's funded status and changes in plan provisions or applicable law. As part of this valuation, we have not performed an analysis of the potential range of future measurements.

I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. In my opinion, the actuarial assumptions used in this report are reasonable, are related to plan experience and expectations, and represent our best estimate of anticipated experience under the system. I believe this report represents an accurate appraisal of the actuarial status of the system performed in accordance with generally accepted actuarial principles and practices relating to pension plans.

Respectfully submitted,  
Public Employee Retirement Administration Commission

  
\_\_\_\_\_  
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January 4, 2018

## 2. EXECUTIVE SUMMARY

### PART A | COSTS UNDER CURRENT VALUATION

The principal results of the January 1, 2017 actuarial valuation are shown below.

#### Present Value of Future Benefits

Actives	\$45,690,372
Retirees, Survivors, and Inactives	<u>45,858,951</u>
Total	\$91,549,323

#### Normal Cost

Total Normal Cost	\$1,624,016
Expected Employee Contributions	<u>913,340</u>
Net Normal Cost	<u>\$710,676</u>

#### Actuarial Liability and Development of Unfunded Actuarial Liability

Actives	\$31,320,617
Retirees, Survivors, and Inactives	<u>45,858,951</u>
Total	\$77,179,568
Assets	<u>57,877,896</u>
Unfunded Actuarial Liability	<u>\$19,301,672</u>

The Board recently adopted a funding schedule effective in FY18. The appropriation for FY18 under this funding schedule is shown on page 10 and the complete funding schedule is shown on page 11.

## 2. EXECUTIVE SUMMARY *(continued)*

### PART B | COMPARISON WITH PRIOR VALUATION

The last full valuation was performed by PERAC as of January 1, 2015. The investment return assumption was decreased from 7.50% to 7.40% effective with this valuation. The mortality assumption is based on a review of State Retirement System mortality from 2013 to 2015 which we used as a proxy for local system retiree mortality. We plan to perform a more complete analysis of local system mortality over the next year. Other assumptions are based on our Local Experience Study Analysis issued in 2002. Below we have shown a comparison of the results between the two valuations.

	PERAC 1/1/17	PERAC 1/1/15	Increase (Decrease)	% Increase (Decrease)
Total Normal Cost	\$1,624,016	\$1,528,331	\$95,685	6.3%
Expected Employee Contributions	<u>913,340</u>	<u>868,224</u>	<u>45,116</u>	5.2%
Net Normal Cost	<u>\$710,676</u>	<u>\$660,107</u>	<u>\$50,569</u>	7.7%
Actuarial Liability				
Actives	\$31,320,617	\$31,068,649	\$251,968	0.8%
Retirees and Inactives	<u>45,858,951</u>	<u>40,911,104</u>	<u>4,947,847</u>	12.1%
Total	\$77,179,568	\$71,979,753	\$5,199,815	7.2%
Assets	<u>57,877,896</u>	<u>51,141,966</u>	<u>6,735,930</u>	13.2%
Unfunded Actuarial	<u>\$19,301,672</u>	<u>\$20,837,787</u>	<u>(\$1,536,115)</u>	(7.4%)
Funded Ratio	75.0%	71.1%	3.9%	

## 2. EXECUTIVE SUMMARY *(continued)*

### PART B | COMPARISON WITH PRIOR VALUATION *(continued)*

Actives	PERAC 1/1/17	PERAC 1/1/15	% Difference
Number	329	334	(1.5%)
Total Payroll	\$10,903,238	\$10,358,980	5.3%
Average Salary	\$33,141	\$31,015	6.9%
Average Age	47.7	47.9	(0.4%)
Average Service	11.1	11.6	(4.3%)

Retirees and Survivors	PERAC 1/1/17	PERAC 1/1/15	% Difference
Number	228	217	5.1%
Total Benefits*	\$4,517,066	\$4,081,755	10.7%
Average Benefits*	\$19,812	\$18,810	5.3%
Average Age	73.8	73.6	0.3%

*\*excluding State reimbursed COLA*

## 2. EXECUTIVE SUMMARY *(continued)*

### PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION

#### **Funded Status**

The unfunded actuarial liability (UAL) and funded ratio are measures of the plan's funded status. These measures reflect the plan's position as of January 1, 2017. We believe these measures by themselves are not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations or assessing the need for or the amount of future contributions. However, we believe these measures, in conjunction with the plan's funding schedule shown on page 11, are appropriate for assessing the amount of future contributions.

The UAL in this valuation reflects the actuarial value of assets, a method that recognizes investment gains and losses over five years. As of January 1, 2017, the actuarial value of assets is 107.6% of the market value. On a market value basis, the UAL is \$23.4 million and the funded ratio is 69.7%.

#### **Plan Experience**

##### *Plan Liabilities*

Since the last valuation, there was a gain on plan liabilities of approximately \$1.2 million (the actuarial liability was less than expected). This gain is primarily due to salary increases for continuing active members increasing less than assumed (average pay increased 2.6% per year for continuing actives). This gain is determined before reflecting the assumption change discussed on the next few pages.

##### *Plan Assets*

The Board previously adopted an asset smoothing methodology to determine the actuarial value of assets (AVA). As of January 1, 2017, the actuarial value of assets is \$57.9 million compared with the market value of \$53.8 million. There was an asset loss on a market value basis of approximately \$8.8 million over the 2-year period. The rates of return on a market value basis in 2015 and 2016 were -0.8% and 0.1% respectively. On an AVA basis, the rates of return for 2015 and 2016 were 9.2% and 7.5% respectively.

The AVA as of January 1, 2015 was 90.8% of the market value. As of January 1, 2017, the AVA is 107.6% of the market value. The recognition of a portion of prior deferred investment gains and losses during 2015 and 2016 partially contributed to an asset gain of approximately \$960,000 over the 2-year period on an AVA basis.

##### *Total*

There was a total net gain of approximately \$2.16 million since the last valuation (\$1.2 million gain on actuarial liability plus \$960,000 gain on the actuarial value of assets).

#### **Actuarial Assumptions**

##### *Investment Return*

For local retirement systems, PERAC's "standard" investment return assumption was 8.0% in our 2012 actuarial valuations. This had been our standard assumption (assuming a reasonable asset allocation) for over 15 years. Beginning with our January 1, 2013 actuarial valuations of local systems, we generally recommended an investment return assumption of 7.75%. For our January 1, 2015 actuarial valuations, we recommended reducing this assumption further. For our 2016 actuarial valuations, we generally recommended a 7.50% assumption. The trend both in Massachusetts and across the country over the past 15 years has been to steadily reduce this assumption.



## 2. EXECUTIVE SUMMARY *(continued)*

### PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION *(continued)*

Early this year, NEPC, PRIT's investment consultant, provided figures for 30-year expected return projections using a building block approach and the target allocation and expected long-term returns by asset class. The expected annual return is 7.8% (7.3% assuming expenses of 50 basis points and the expected return reflects a gross return) in this study. This figure was the same as the study released last year. Note that the 7.8% average expected return does not mean that the expected return each year will be 7.8%. In fact, over the shorter term (5-7 years) the average expected return is 6.8%. Greater expected returns in later years determined NEPC's long-term expectation. Projected returns are one measure we use to determine the long-term investment return assumption.

We used the NEPC study to help determine a reasonable range for the investment return assumption for 2017 actuarial valuations. We are generally recommending an assumption of 7.25% - 7.50% for 2017 valuations of Pension Reserves Investment Trust (PRIT) systems. Our recommendation for each system is also based partially on the assumption used in the 2015 actuarial valuation.

Our analysis primarily concerns systems with most or all of their assets with the Pension Reserves Investment Trust (PRIT). For non-PRIT systems, we often recommend a lower assumption to reflect generally more conservative investment allocations. Since your system is in the non-PRIT group, we performed additional analysis using information available with respect to the Board's target allocation and expected returns by asset class in determining a recommended assumption. Using the PRIT 30-year expected returns by asset class, and estimating your target allocation, we found the expected return to be somewhat lower than that of PRIT.

As we indicated earlier, we generally recommended a 7.50% assumption in our 2016 local system valuations. As part of our analysis this year, we considered whether to recommend maintaining the 7.50% assumption for 2017 actuarial valuations or reducing the assumption further. A strong case can be made for both positions.

There was no change in the NEPC results from the prior year's analysis. On this basis, maintaining the assumption appears reasonable. In addition, a 7.50% assumption is approximately the average assumption used for large public plans across the country, (7.52% based on a February 2017 NASRA study).

One reason to reduce this assumption would be to place greater reliance on the short-term expectation of 6.8%. Furthermore, public plans across the country continue to reduce this assumption. For example, the California Public Employees' Retirement System (CALPERS) and the California State Teachers' Retirement System (CALSTRS) plans have opted to reduce the current 7.50% assumption to 7.00% over three years and two years, respectively. Several other state systems have recently announced reductions in this assumption for 2017 actuarial valuations (Kentucky, North Carolina, Pennsylvania, and Rhode Island). The 7.52% national average shown above would decrease if the 2017 assumptions for all state systems were known and included. If the trend to reduce this assumption continues, a 7.50% assumption may be seen as an outlier in a few years, whether justified or not.

The Board adopted an assumption of 7.40%. This reflects a reduction in this assumption from 7.50%. We will continue to monitor this assumption and we may recommend decreasing this assumption as part of the January 1, 2019 actuarial valuation. A reduction in the investment return assumption increases the plan's liabilities.

This change increased the normal cost by approximately \$34,000 and the actuarial accrued liability by \$765,000.

## 2. EXECUTIVE SUMMARY *(continued)*

### PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION *(continued)*

#### *Mortality*

A revision to the actuarial standards of practice in 2010 required that future mortality improvements (longer life expectancy) be considered in valuations performed after July, 2011. To begin recognizing this change, as part of our January 1, 2011 local actuarial valuations, we used the RP-2000 mortality table projected 10 years with Scale AA (a mortality improvement scale). In our 2012, 2013 and 2014 valuations, we gradually extended the mortality improvement scale beyond the valuation date. In our 2014 valuations, we projected mortality improvement to 2022 for active members and 2017 for retirees.

Beginning with our January 1, 2015 actuarial valuations, we began using a “fully generational” mortality assumption. A fully generational projection is two-dimensional. The mortality improvement projection is developed based on both the age of a member and the calendar year. We used retiree mortality experience from the State Retirement System from 2012 to 2014 as a proxy in determining the mortality assumption for local systems. We found that the RP-2000 mortality table with projected mortality improvement using the more recently developed projection Scale BB and a base year of 2009 was appropriate for our 2015 valuations. We will maintain this assumption for this actuarial valuation. As is the case with all our assumptions, we will continue to monitor this assumption in each actuarial valuation.

A revised mortality table (the RP-2014 mortality table) was published in 2014. The revised table has no experience related to public plans. We found in our 2015 analysis that the basic table did not match our experience. In 2017, we did further analysis of retiree mortality for the State Retirement System based on deaths in 2015 and 2016. Based on our findings, we modified the State’s assumption in the 2017 valuation to reflect a blue collar version of the RP-2014 table. However, we plan to analyze retiree mortality for local systems over the next year before determining whether any modification to the current assumption is necessary in the next valuation.

#### **Chapter 176 Provisions**

Chapter 176 of the Acts of 2011, An Act Providing for Pension Reform and Benefit Modernization made a number of changes to the Chapter 32 pension law. There are several changes that will have the most impact on decreasing plan liabilities over the longer term. These include an increase in the normal retirement age by two years (for example, from age 65 to age 67 for Group 1 members), an increase in the age (early retirement) reduction factor for ages below the maximum age (from a 4.0% to a 6.0% annual reduction), and an increase in the period for determining a member’s average annual compensation (from 3 years to 5 years).

As of January 1, 2017, there were 142 members hired after April 1, 2012. Since these members have less than five years of service and are generally young, there is relatively little impact on plan costs in this valuation. The normal cost decreased approximately \$50,000 and the actuarial liability decreased approximately \$215,000 for these members compared to the figures under the prior provisions.

#### **COLA Base**

This valuation reflects a \$13,000 COLA base. The 2015 valuation reflected the same base.

## 2. EXECUTIVE SUMMARY *(continued)*

### PART C | FUNDED STATUS AND PLAN EXPERIENCE SINCE PRIOR VALUATION *(continued)*

#### **Funding Schedule**

The funding schedule presented in this report was recently adopted by the board. The FY18 payment and the amortization of the Early Retirement Incentive programs (ERIs) were maintained from the prior schedule except the ERI payments were adjusted to reflect the revised investment return assumption. The schedule amortizes the unfunded actuarial liability through 2029 with payments increasing 4.5% each year.

#### **GASB 67/68**

The results of the 2013 valuation were used to implement two statements of the Governmental Accounting Standards Board (GASB) that replace GASB 25 and GASB 27. The statements are commonly referred to as GASB 67 and GASB 68. GASB 67 relates to financial reporting for state and local government pension plans (plan financials) and was effective for fiscal years beginning after June 15, 2013. Therefore, GASB 67 was first effective for the plan year ending December 31, 2014. GASB 68 relates to financial reporting by state and local governments for pension plans (employer financials) and is effective for fiscal years beginning after June 15, 2014. GASB 68 was first effective for the fiscal year ending June 30, 2015 and was determined using a measurement date of December 31, 2014. We have not provided any GASB 67/68 exhibits in this report. These disclosure exhibits have been provided under separate cover. The results of this valuation will be used in the GASB disclosures for the year ending December 31, 2017.

### 3. SUMMARY OF VALUATION RESULTS

A. Number of Members on Current Valuation Date	
Active Members	329
Vested Terminated Members	12
Retired Members and Survivors	<u>228</u>
Total	569
B. Total Regular Compensation of Active Members	\$10,903,238
C. Normal Cost	
Superannuation	\$1,096,282
Death	119,379
Disability	256,377
Termination	<u>151,978</u>
Total Normal Cost	\$1,624,016
Expected Employee Contributions	<u>913,340</u>
Net Employer Normal Cost	\$710,676
D. Actuarial Liability	
Active	
Superannuation	\$29,119,992
Death	553,612
Disability	1,148,717
Termination	<u>498,296</u>
Total Active	\$31,320,617
Vested Terminated Members	1,214,122
Non-Vested Terminated Members	519,140
Retirees and Survivors	<u>44,125,689</u>
Total Actuarial Liability	\$77,179,568
E. Actuarial Value of Assets	57,877,896
F. Unfunded Actuarial Liability: D – E	\$19,301,672
G. Funded Ratio: E/D	75.0%

## 4. APPROPRIATION DEVELOPMENT FOR FISCAL YEAR 2018

### PART A | DERIVATION OF APPROPRIATION

#### Cost Under Current Funding Schedule

1. a. Employer Normal Cost as of January 1, 2017	\$710,676
b. Estimated Expenses	\$300,000
c. Total Employer Normal Cost (a+b, adjusted for timing)	\$1,048,071
2. Net 3(8)(c) payments	\$100,000
3. a. Unfunded Actuarial Liability as of January 1, 2017	\$18,512,116
b. FY18 amortization payment (12-year, 4.5% increasing) *	\$1,837,213
4. a. Unfunded Liability due to 2002 ERI	\$121,128
b. FY18 amortization payment (12-year, 4.0% increasing)	\$12,417
5. a. Unfunded Liability due to 2003 ERI	\$668,428
b. FY18 amortization payment (12-year, 4.0% increasing)	\$68,520
6. Total FY18 Payment [Sum of 1(c), 2, 3(b), 4(b) and 5(b)]	\$3,066,221

\* FY18 appropriation was maintained at the same level as the prior schedule.

All amounts assume payments will be made July 1 of each fiscal year.

## 4. APPROPRIATION DEVELOPMENT FOR FISCAL YEAR 2018

(continued)

### PART B | CURRENT FUNDING SCHEDULE

<b>Fiscal Year</b>	<b>Normal Cost</b>	<b>Net 3(8)(c)</b>	<b>Amort. UAL</b>	<b>Amort. of 2002 ERI</b>	<b>Amort. of 2003 ERI</b>	<b>Total Cost</b>	<b>Unfunded Act. Liab.</b>	<b>Total Cost % Increase</b>
2018	1,048,071	100,000	1,837,213	12,417	68,520	3,066,221	20,015,834	
2019	1,095,234	100,000	1,936,296	12,913	71,261	3,215,704	19,436,912	4.9%
2020	1,144,520	100,000	2,023,429	13,430	74,111	3,355,490	18,705,259	4.3%
2021	1,196,023	100,000	2,114,484	13,967	77,076	3,501,550	17,822,266	4.4%
2022	1,249,844	100,000	2,209,635	14,526	80,159	3,654,164	16,772,378	4.4%
2023	1,306,087	100,000	2,309,069	15,107	83,365	3,813,628	15,538,695	4.4%
2024	1,364,861	100,000	2,412,977	15,711	86,700	3,980,249	14,102,859	4.4%
2025	1,426,280	100,000	2,521,561	16,340	90,168	4,154,348	12,444,944	4.4%
2026	1,490,462	100,000	2,635,031	16,993	93,774	4,336,261	10,543,324	4.4%
2027	1,557,533	100,000	2,753,608	17,673	97,525	4,526,339	8,374,543	4.4%
2028	1,627,622	100,000	2,877,520	18,380	101,426	4,724,948	5,913,161	4.4%
2029	1,700,865	100,000	3,007,008	19,115	105,483	4,932,472	3,131,607	4.4%
2030	1,777,404	100,000				1,877,404	0	

All amounts assume payments will be made July 1 of each fiscal year.

Amortization of the unfunded liability on a 4.5% annual increasing basis to FY29.

FY18 normal cost includes assumed expenses of \$300,000 and is assumed to increase 4.5% per year.

FY18 appropriation was maintained at the same level as the prior schedule.

As noted on page 5, the AVA is 107.6% of the market value. The plan has a deferred asset loss which will be recognized in the next few years and increase the UAL. The UAL on a market value basis is \$4.1 million greater than the UAL using the AVA. This is a significant difference. To illustrate this impact, if a schedule using the market value of assets had been adopted in this valuation (with similar appropriations to the schedule actually adopted) the amortization period would need to be extended by about three years.

This is important to keep in mind as we move forward. We expect the appropriations determined by the 2019 actuarial valuation will increase from the levels based on the 2017 valuation unless the schedule is extended to maintain the appropriation. Any actuarial losses or change in plan assumptions would exacerbate this issue.

## 5. GASB INFORMATION

The actuarial information required by Governmental Accounting Standards Board (GASB) Statement Nos. 67 and 68 replaces the information required by Statement Nos. 25 and 27.

The information required by GASB 67 (plan) is to be reported and measured as of December 31 each year. For the initial measurement as of December 31, 2014, we rolled the liabilities forward from the prior valuation to December 31, 2014.

The information required by GASB 68 (employer) is to be reported as of the end of the fiscal year (June 30 for cities and towns). We are allowed to select a measurement date at any date during the fiscal year. For the initial measurement as of June 30, 2015, we selected a measurement date of December 31, 2014 which is consistent with GASB 67.

We have not provided any GASB 67 or 68 exhibits in this valuation report. We have provided the disclosure exhibits under separate cover.

Although GASB 25 no longer applies, we are including the schedule of funding progress previously required by the Statement to provide historical context.

### Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL)* (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Cov. Payroll ((b-a)/c)
1/1/2017	\$57,877,896	\$77,179,568	\$19,301,672	75.0%	\$10,903,238	177.0%
1/1/2015	\$51,141,966	\$71,979,753	\$20,837,787	71.1%	\$10,358,980	201.2%
1/1/2013	\$42,504,356	\$65,656,072	\$23,151,716	64.7%	\$10,089,660	229.5%
1/1/2011	\$41,029,431	\$60,459,413	\$19,429,982	67.9%	\$10,388,467	187.0%
1/1/2009	\$38,262,875	\$56,836,816	\$18,573,941	67.3%	\$9,877,348	188.0%

*\*excludes State reimbursed COLA*

## 6. PLAN ASSETS

### A | BREAKDOWN OF ASSETS BY INVESTMENT TYPE

Cash and Cash Equivalents	\$5,016
Short Term Investments	373,809
Fixed Income Securities	15,297,652
Equities	36,728,455
Pooled Alternative Investments	12,337
Hedge Funds	1,031,133
PRIT Fund	373,122
Interest Due and Accrued	115,582
Accounts Receivable	60,290
Accounts Payable	<u>(203,921)</u>
Total	\$53,793,475

### B | BREAKDOWN OF ASSETS BY FUND

Annuity Savings Fund	\$10,656,103
Annuity Reserve Fund	3,636,724
Pension Reserve Fund	<u>39,500,648</u>
Total	\$53,793,475

C | MARKET VALUE OF ASSETS \$53,793,475

D | ACTUARIAL VALUE OF ASSETS \$57,877,896



## 6. PLAN ASSETS *(continued)*

### E | DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

	2016	2017
<b>A. Development of total investment income including appreciation</b>		
1. Beginning of year market value	54,905,158	53,793,475
2a. Employee contributions	982,340	
b. Employer contributions	2,939,245	
c. Other receipts	208,100	
d. Total receipts: (a) + (b) + (c)	4,129,685	
e. Benefit payments	4,502,946	
f. Expenses	367,460	
g. Other disbursements	331,641	
h. Total disbursements: (e) + (f) + (g)	5,202,047	
i. Cash flow: (d) – (h)	(1,072,362)	
3. End of year market value	53,793,475	
4. Investment income including appreciation: (3) – (1) – (2(i))	(39,321)	
<b>B. Expected market value development</b>		
1. Beginning of year market value	54,905,158	
2. Cash flow (A2(i))	(1,072,362)	
3. Expected Return on (1)	4,117,887	
4. Expected return on cash flow A2(i) x 0.075 / 2	(40,214)	
5. Expected market value end of year (1)+(2)+(3)+(4)	57,910,469	
<b>C. Gain/(loss) for year: A3-B5</b>	(4,116,994)	
<b>D. Development of Actuarial Value of Assets</b>		
1. Beginning of year market value	54,905,158	53,793,475
2a. Asset gain/(loss) in prior year	(4,681,139)	(4,116,994)
b. Asset gain/(loss) in 2 <sup>nd</sup> prior year	2,537,838	(4,681,139)
c. Asset gain/(loss) in 3 <sup>rd</sup> prior year	5,013,611	2,537,838
d. Asset gain/(loss) in 4 <sup>th</sup> prior year	1,258,974	5,013,611
3. Unrecognized gain/(loss) .8 x [2a] + .6 x [2b] + .4 x [2c] + .2 x [2d]	35,031	(4,084,421)
4. Beginning of year actuarial value of assets: [1] - [3]	54,870,127	57,877,896
5. Actuarial value / Market value	99.9%	107.6%
6. Adjusted actuarial value: (4) but not less than 90% nor greater than 110% of market value	54,870,127	57,877,896

## 7. INFORMATION ON SYSTEM MEMBERSHIP

A critical element of an actuarial valuation is accurate and up-to-date membership information. PERAC conducted an extensive review of member data submitted for this valuation.

### PART A | ACTIVE MEMBERS

	Actives	Vested Terminations
Number of Members	329	12
Average Age	47.7	52.4
Average Service	11.1	17.5
Average Salary	\$33,141	\$25,915
Average Annuity Savings Fund Balance	\$29,320	\$39,567

### Age by Service Distribution of Active Members

Years of Service								
Present Age	0 - 4	5 -9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total
0 - 24	16							16
25 - 29	21	4						25
30 - 34	16	13	4					33
35 - 39	19	7	2	6				34
40 - 44	13	8	4	3				28
45 - 49	8	6	9	3	6	1		33
50 - 54	7	7	9	5	6	10	1	45
55 - 59	11	5	11	1	7	5	8	48
60 - 64	11	1	5	4	3	6	7	37
65+	5	5	4	4	7	0	5	30
Total	127	56	48	26	29	22	21	329

## 7. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

### PART A | ACTIVE MEMBERS *(continued)*

#### Salary by Age Distribution of Active Members

Present Age	Number of Members	Total Salary	Average Salary
0 - 24	16	\$321,250	\$20,078
25 - 29	25	\$714,586	\$28,583
30 - 34	33	\$1,322,782	\$40,084
35 - 39	34	\$1,115,633	\$32,813
40 - 44	28	\$843,847	\$30,137
45 - 49	33	\$1,137,880	\$34,481
50 - 54	45	\$1,713,876	\$38,086
55 - 59	48	\$1,692,094	\$35,252
60 - 64	37	\$1,290,080	\$34,867
65+	30	\$751,210	\$25,040
Total	329	\$10,903,238	\$33,141

## 7. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

### PART B | RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	163	3	32	30	228
Average Age	74.4	72.9	66.0	79.0	73.8
Average Annual Benefit	\$18,582	\$13,888	\$33,161	\$14,766	\$20,065

### Benefit by Payment and Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Total Annuity	\$515,639	\$5,620	\$92,559	\$39,332	\$653,150
Pension (excluding State reimbursed COLA)	\$2,484,617	\$33,180	\$957,602	\$388,517	\$3,863,916
State reimbursed COLA	\$28,682	\$2,865	\$10,980	\$15,135	\$57,662
Total	\$3,028,938	\$41,665	\$1,061,141	\$442,984	\$4,574,728

## 7. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

### PART B | RETIREES & SURVIVORS *(continued)*

#### Benefit by Age Distribution

Present Age	Number of Members	Total Benefits	Average Benefits
Less than 40	0	\$0	\$0
40 - 44	0	\$0	\$0
45 - 49	0	\$0	\$0
50 - 54	0	\$0	\$0
55 - 59	12	\$271,277	\$22,606
60 - 64	28	\$798,675	\$28,524
65 - 69	58	\$1,226,044	\$21,139
70 - 74	42	\$901,000	\$21,452
75 - 79	26	\$430,704	\$16,566
80 - 84	23	\$388,883	\$16,908
85 - 89	22	\$319,875	\$14,540
90+	17	\$238,270	\$14,016
Totals	228	\$4,574,728	\$20,065

## 8. VALUATION COST METHODS

### PART A | ACTUARIAL COST METHOD

The Actuarial Cost Method which was used to determine pension liabilities in this valuation is known as the *Entry Age Normal Cost Method*. Under this method the *Normal Cost* for each active member on the valuation date is determined as the level percent of salary, which, if paid annually from the date the employee first became a member of the retirement system, would fully fund by retirement, death, disability or termination, the projected benefits which the member is expected to receive. The *Actuarial Liability* for each member is determined as the present value as of the valuation date of all projected benefits which the member is expected to receive, minus the present value of future annual Normal Cost payments expected to be made to the fund. Since only active members have a Normal Cost, the Actuarial Liability for inactives, retirees and survivors is simply equal to the present value of all projected benefits. The sum of Normal Cost and Actuarial Liability for each member is equal to the Normal Cost and Actuarial Liability for the Plan. The *Unfunded Actuarial Liability* is the Actuarial Liability less current assets.

The Normal Cost for a member will remain a level percent of salary for each year of membership except for changes in provisions of the Plan or the actuarial assumptions employed in projection of benefits and present value determinations. The Normal Cost for the entire system will also change due to the addition of new members or the retirement, death or termination of members. The Actuarial Liability for a member will increase each year to reflect the additional accrual of Normal Cost. It will also change if the Plan provisions or actuarial assumptions are changed.

Differences each year between the actual experience of the Plan and the experience projected by the actuarial assumptions are reflected by adjustments to the Unfunded Actuarial Liability. An experience difference which increases the Unfunded Actuarial Liability is called an *Actuarial Loss* and one which decreases the Unfunded Actuarial Liability is called an *Actuarial Gain*.

### PART B | ASSET VALUATION METHOD

The actuarial value of assets is determined in accordance with the deferred recognition method under which 20% of the gains or losses occurring in the prior year are recognized, 40% of those occurring 2 years ago, etc., so that 100% of gains or losses occurring 5 years ago are recognized. The actuarial value of assets will be adjusted, if necessary, in order to remain between 90% and 110% of market value.

## 9. ACTUARIAL ASSUMPTIONS

### ***Investment Return***

7.40% per year net of investment expenses (*prior assumption 7.50%*)

The investment return assumption is a long term assumption and is based on capital market expectations by asset class, historical returns, and professional judgment. We considered analysis prepared by PRIM's investment advisor using a building block approach which included expected returns by asset class, risk analysis, and the determination of a 30 year expected target rate of return. We used this analysis in conjunction with the System's target allocation.

### ***Interest Rate Credited to the Annuity Savings Fund***

3.5% per year

### ***Assumed Rate of Cost of Living Increases (COLA)***

3.0% per year (on the first \$13,000 of an allowance)

### ***Mortality***

Pre-retirement mortality reflects RP-2000 Employees table projected generationally with Scale BB and a base year of 2009 (gender distinct). (*Same as prior assumption.*)

Post-retirement mortality reflects RP-2000 Healthy Annuitant table projected generationally with Scale BB and a base year of 2009 (gender distinct). (*Same as prior assumption.*)

For disabled members, the mortality rate is assumed to be in accordance with the RP-2000 Healthy Annuitant Table projected generationally with Scale BB and a base year of 2012 (gender distinct). (*Same as prior assumption.*)

It is assumed that 55% of pre-retirement deaths are job-related for Group 1 and 2 members and 90% are job-related for Group 4 members. For members retired under an Accidental Disability, 40% of deaths are assumed to be from the same cause as the disability.

We reviewed a sampling of a few local retirement systems and compared those results with the results we found in performing our analysis on the State Retirement System for the years 2012-2014. We found the results comparable, so we used the same assumption we used with the State Retirement System. For that analysis, the mortality assumptions reflect our recent experience analysis published in 2014 (based on the years 2006-2011), updated to reflect data through January 1, 2015 for post-retirement mortality, and professional judgment. As such, this assumption reflects observed current mortality as well as expected mortality improvement.

## 9. ACTUARIAL ASSUMPTIONS *(continued)*

### ***Salary Increase***

Service	Group 1	Group 2	Group 4
0	6.00%	6.00%	7.00%
1	5.50%	5.50%	6.50%
2	5.50%	5.50%	6.00%
3	5.25%	5.25%	5.75%
4	5.25%	5.25%	5.25%
5	4.75%	4.75%	5.25%
6	4.75%	4.75%	4.75%
7	4.50%	4.50%	4.75%
8	4.50%	4.50%	4.75%
9	4.25%	4.50%	4.75%
10+	4.25%	4.50%	4.75%

The salary increase assumption reflects both prior experience and professional judgment.

### ***Withdrawal***

Based on analysis of past experience. Annual rates are based on years of service. Sample annual rates for Groups 1 and 2 are shown below. For Group 4 members the rate is 0.015 each year for service up to and including 10 years. No withdrawal is assumed thereafter.

Service	Groups 1 & 2
0	0.150
5	0.076
10	0.054
15	0.033
20	0.020

Withdrawal rates are based on our most recent experience analysis which reviewed age, gender and job group. The assumption reflects this analysis as well as professional judgment.



## 9. ACTUARIAL ASSUMPTIONS *(continued)*

### ***Disability***

Based on an analysis of past experience. It is also assumed that the percentage of job-related disabilities is 55% for Groups 1 & 2 and 90% for Group 4.

Age	Groups 1 & 2	Group 4
20	0.00010	0.0010
30	0.00030	0.0030
40	0.00101	0.0030
50	0.00192	0.0125
60	0.00280	0.0085

Disability rates are based on our most recent experience analysis which reviewed age, gender and job group. The assumption reflects this analysis as well as professional judgment.

### ***Expenses***

An amount of \$300,000 has been included in the Normal Cost for FY18. This amount includes estimated administrative expenses and a portion of the investment related expenses. This amount is assumed to increase by 4.5% each year.

### ***Members Hired on or After April 2, 2012***

Chapter 176 of the Acts of 2011 changed the retirement eligibility for the different job groups. For example, Group 1 eligibility changed from 55 years old with 10 years of service to 60 years old with 10 years of service (Chapter 176 removed the provision that allowed retirement at any age with 20 years of service). Our software system is programmed such that at any given age, a member is assumed to either retire or terminate, but not both. Therefore, we adjusted the retirement and termination rates for members impacted by Chapter 176. For example, for Group 1 members, we removed retirement rates for ages 50-59. Termination rates remain in effect for those years. We will monitor these assumptions going forward.

## 9. ACTUARIAL ASSUMPTIONS *(continued)*

### ***Retirement***

Age	Groups 1 & 2		Group 4
	Male	Female	
45-49	0.000	0.000	0.010
50	0.010	0.015	0.020
51	0.010	0.015	0.020
52	0.010	0.020	0.020
53	0.010	0.025	0.050
54	0.020	0.025	0.075
55	0.020	0.055	0.150
56	0.025	0.065	0.100
57	0.025	0.065	0.100
58	0.050	0.065	0.100
59	0.065	0.065	0.150
60	0.120	0.050	0.200
61	0.200	0.130	0.200
62	0.300	0.150	0.250
63	0.250	0.125	0.250
64	0.220	0.180	0.300
65	0.400	0.150	1.000
66	0.250	0.200	1.000
67	0.250	0.200	1.000
68	0.300	0.250	1.000
69	0.300	0.200	1.000
70 and after	1.000	1.000	1.000

Retirement rates are based on our most recent experience analysis which reviewed age, service, gender and job group. The assumption reflects this analysis as well as professional judgment.

## 10. SUMMARY OF PLAN PROVISIONS

### ADMINISTRATION

There are 104 contributory retirement systems for public employees in Massachusetts. Each system is governed by a retirement board and all boards, although operating independently, are governed by Chapter 32 of the Massachusetts General Laws. This law in general provides uniform benefits, uniform contribution requirements and a uniform accounting and funds structure for all systems.

### PARTICIPATION

Participation is mandatory for all full-time employees. Eligibility with respect to part-time, provisional, temporary, seasonal or intermittent employment is governed by regulations promulgated by the retirement board, and approved by PERAC. Membership is optional for certain elected officials.

There are 3 classes of membership in the retirement system:

#### **Group 1:**

General employees, including clerical, administrative, technical and all other employees not otherwise classified.

#### **Group 2:**

Certain specified hazardous duty positions.

#### **Group 4:**

Police officers, firefighters, and other specified hazardous positions.

### MEMBER CONTRIBUTIONS

Member contributions vary depending on the most recent date of membership:

Prior to 1975:	5% of regular compensation
1975 - 1983:	7% of regular compensation
1984 to 6/30/96:	8% of regular compensation
7/1/96 to present:	9% of regular compensation
1979 to present:	an additional 2% of regular compensation in excess of \$30,000.

In addition, members of Group 1 who join the system on or after April 2, 2012 will have their withholding rate reduced to 6 % after achieving 30 years of creditable service.

## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

### RATE OF INTEREST

Interest on regular deductions made after January 1, 1984 is a rate established by PERAC in consultation with the Commissioner of Banks. The rate is obtained from the average rates paid on individual savings accounts by a representative sample of at least 10 financial institutions.

### RETIREMENT AGE

The mandatory retirement age for some Group 2 and Group 4 employees is age 65. Most Group 2 and Group 4 members may remain in service after reaching age 65. Group 2 and Group 4 members who are employed in certain public safety positions are required to retire at age 65. There is no mandatory retirement age for employees in Group 1.

### SUPERANNUATION RETIREMENT

A person who became a member before April 2, 2012 is eligible for a superannuation retirement allowance (service retirement) upon meeting the following conditions:

- completion of 20 years of service, or
- attainment of age 55 if hired prior to 1978, or if classified in Group 4, or
- attainment of age 55 with 10 years of service, if hired after 1978, and if classified in Group 1 or 2

A person who became a member on or after April 2, 2012 is eligible for a superannuation retirement allowance (service retirement) upon meeting the following conditions:

- attainment of age 60 with 10 years of service if classified in Group 1, or
- attainment of age 55 with 10 years of service if classified in Group 2, or
- attainment of age 55 if hired prior to 1978, or if classified in Group 4.

## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

### AMOUNT OF BENEFIT

A member's annual allowance is determined by multiplying average salary by a benefit rate related to the member's age and job classification at retirement, and the resulting product by his creditable service. The amount determined by the benefit formula cannot exceed 80% of the member's highest three year (or five year salary as discussed below) average salary. For veterans as defined in G.L. c. 32, s. 1, there is an additional benefit of \$15 per year for each year of creditable service, up to a maximum of \$300.

- Salary is defined as gross regular compensation. For employees who become members after January 1, 2011, regular compensation is limited to 64% of the federal limit found in 26 U.S.C. 401(a)(17). In addition, regular compensation for members who retire after April 2, 2012 will be limited to prohibit "spiking" of a member's salary to increase the retirement benefit.
- For persons who became members prior to April 2, 2012, Average Salary is the average annual rate of regular compensation received during the 3 consecutive years that produce the highest average, or, if greater, during the last 3 years (whether or not consecutive) preceding retirement.
- For persons who became members on or after April 2, 2012, Average Salary is the average annual rate of regular compensation received during the 5 consecutive years that produce the highest average, or, if greater, during the last 5 years (whether or not consecutive) preceding retirement.
- The Benefit Rate varies with the member's retirement age. For persons who became members prior to April 2, 2012 the highest rate of 2.5% applies to Group 1 employees who retire at or after age 65, Group 2 employees who retire at or after age 60, and to Group 4 employees who retire at or after age 55. A .1% reduction is applied for each year of age under the maximum age for the member's group. For Group 2 employees who terminate from service under age 55, the benefit rate for a Group 1 employee shall be used.
- For persons who became members on or after April 2, 2012 and retire with less than 30 years of creditable service, the highest rate of 2.5% applies to Group 1 employees who retire at or after age 67, Group 2 employees who retire at or after age 62, and to Group 4 employees who retire at or after age 57. A .15% reduction is applied for each year of age under the maximum age for the member's group.
- For persons who became members on or after April 2, 2012 and retire with more than 30 years of creditable service, the highest rate of 2.5% applies to Group 1 employees who retire at or after age 67, Group 2 employees who retire at or after age 62, and to Group 4 employees who retire at or after age 55. A .125% reduction is applied for each year of age under the maximum age for the member's group.

## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

### DEFERRED VESTED BENEFIT

A participant who has attained the requisite years of creditable service can elect to defer his or her retirement until a later date. Group 4 employees cannot defer beyond age 65. All participants must begin to receive a retirement allowance or withdraw their accumulated deductions no later than April 15 of the calendar year following the year they reach age 70½.

### WITHDRAWAL OF CONTRIBUTIONS

Member contributions may be withdrawn upon termination of employment. The interest rate for employees who first become members on or after January 1, 1984 who voluntarily withdraw their contributions with less than 10 years of service will be 3%. Interest payable on all other withdrawals will be set at regular interest.

### DISABILITY RETIREMENT

The Massachusetts Retirement Plan provides 2 types of disability retirement benefits:

#### ORDINARY DISABILITY

**Eligibility:** Non-veterans who become totally and permanently disabled by reason of a non-job related condition with at least 10 years of creditable service (or 15 years creditable service in systems in which the local option contained in G.L. c. 32, s.6(1) has not been adopted).

Veterans with ten years of creditable service who become totally and permanently disabled by reason of a non-job related condition prior to reaching “maximum age”. “Maximum age” applies only to employees classified in Group 4 who are subject to mandatory retirement.

**Retirement Allowance:** For persons who became members prior to April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 55. If the member is a veteran, the benefit is 50% of the member’s final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 55, he or she will receive not less than the superannuation allowance to which he or she is entitled.

For persons in Group 1 who became members on or after April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 60. If the member is a veteran, the benefit is 50% of the member’s final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 60, he or she will receive not less than the superannuation allowance to which he or she would have been entitled had they retired for superannuation.

## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

### ORDINARY DISABILITY *(continued)*

For persons in Group 2 and Group 4 who became members on or after April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 55. If the member is a veteran, the benefit is 50% of the member's final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 55, he or she will receive not less than the superannuation allowance to which he or she is entitled.

### ACCIDENTAL DISABILITY

**Eligibility:** Applies to members who become permanently and totally unable to perform the essential duties of the position as a result of a personal injury sustained or hazard undergone while in the performance of duties. There are no minimum age or service requirements.

**Retirement Allowance:** 72% of salary plus an annuity based on accumulated member contributions, with interest. This amount is not to exceed 100% of pay. For those who became members in service after January 1, 1988 or who have not been members in service continually since that date, the amount is limited to 75% of pay. There is an additional pension of \$871.56 per year (or \$312.00 per year in systems in which the local option contained in G.L. c. 32, s. 7(2)(a)(iii) has not been adopted), per child who is under 18 at the time of the member's retirement, with no age limitation if the child is mentally or physically incapacitated from earning. The additional pension may continue up to age 22 for any child who is a full time student at an accredited educational institution. For systems that have adopted Chapter 157 of the Acts of 2005, veterans as defined in G.L. c. 32, s. 1 receive an additional benefit of \$15 per year for each year of creditable service, up to a maximum of \$300.

### ACCIDENTAL DEATH

**Eligibility:** Applies to members who die as a result of a work-related injury or if the member was retired for accidental disability and the death was the natural and proximate result of the injury or hazard undergone on account of which such member was retired.

**Allowance:** An immediate payment to a named beneficiary equal to the accumulated deductions at the time of death, plus a pension equal to 72% of current salary and payable to the surviving spouse, dependent children or the dependent parent, plus a supplement of \$871.56 per year, per child (or \$312.00 per year in systems in which the local option contained in G.L. c. 32, s. 9(2)(d)(ii) has not been adopted), payable to the spouse or legal guardian until all dependent children reach age 18 or 22 if a full time student, unless mentally or physically incapacitated.

The surviving spouse of a member of a police or fire department or any corrections officer who, under specific and limited circumstances detailed in the statute, suffers an accident and is killed or sustains injuries while in the performance of his duties that results in his death, may receive a pension equal to the maximum salary for the position held by the member upon his death.

In addition, an eligible family member may receive a one-time payment of \$150,000.00 from the State Retirement Board.

## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

### DEATH AFTER ACCIDENTAL DISABILITY RETIREMENT

Effective November 7, 1996, Accidental Disability retirees were allowed to select Option C at retirement and provide a benefit for an eligible survivor. For Accidental Disability retirees prior to November 7, 1996, who could not select Option C, if the member's death is from a cause unrelated to the condition for which the member received accidental disability benefits, a surviving spouse will receive an annual allowance of \$6,000. For Systems that accept the provisions of Section 28 of Chapter 131 of the Acts of 2010 the amount of this benefit is \$9,000 and for Systems that accept the provisions of Section 65 of Chapter 139 of the Acts of 2012 the amount of this benefit is \$12,000.

### DEATH IN ACTIVE SERVICE

**Allowance:** An immediate allowance equal to that which would have been payable had the member retired and selected Option C on the day before his or her death. For a member who became a member prior to April 2, 2012 whose death occurred prior to the member's superannuation retirement age, the age 55 benefit rate is used. For a member classified in Group 1 who became a member on or after April 2, 2012 whose death occurred, the age 60 benefit rate is used. If the member died after age 60, the actual age is used. The minimum annual allowance payable to the surviving spouse of a member in service who dies with at least two years of creditable service is \$3,000 unless the retirement system has accepted the local option increasing this minimum annual allowance to \$6,000, provided that the member and the spouse were married for at least one year and living together on the member's date of death.

The surviving spouse of such a member in service receives an additional allowance equal to the sum of \$1,440 per year for the first child and \$1,080 per year for each additional child until all dependent children reach age 18 or 22 if a full time student, unless mentally or physically incapacitated.

### COST OF LIVING

If a system has accepted Chapter 17 of the Acts of 1997, and the Retirement Board votes to pay a cost of living increase (COLA) for that year, the percentage is determined based on the increase in the Consumer Price Index used for indexing Social Security benefits, but cannot exceed 3.0%. Section 51 of Chapter 127 of the Acts of 1999, if accepted, allows boards to grant COLA increases greater than that determined by CPI but not to exceed 3.0%. The first \$12,000 of a retiree's total allowance is subject to a COLA. The total COLA for periods from 1981 through 1996 is paid for by the Commonwealth of Massachusetts.

Under the provisions of Chapter 32, Section 103(j) inserted by Section 19 of Chapter 188 of the Acts of 2010, systems may increase the maximum base on which the COLA is calculated in multiples of \$1,000. Each increase must be accepted by a majority vote of the Retirement Board and approved by the legislative body.



## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

### METHODS OF PAYMENT

A member may elect to receive his or her retirement allowance in one of 3 forms of payment.

**Option A:** Total annual allowance, payable in monthly installments, commencing at retirement and terminating at the member's death.

**Option B:** A reduced annual allowance, payable in monthly installments, commencing at retirement and terminating at the death of the member, provided, however, that if the total amount of the annuity portion received by the member is less than the amount of his or her accumulated deductions, including interest, the difference or balance of his accumulated deductions will be paid in a lump sum to the retiree's beneficiary or beneficiaries of choice.

**Option C:** A reduced annual allowance, payable in monthly installments, commencing at retirement. At the death of the retired employee, 2/3 of the allowance is payable to the member's designated beneficiary (who may be the spouse, or former spouse who is unmarried at the time of retirement for a member whose retirement becomes effective on or after February 2, 1992, child, parent, sister, or brother of the employee) for the life of the beneficiary. For members who retired on or after January 12, 1988, if the beneficiary pre-deceases the retiree, the benefit payable increases (or "pops up" to Option A) based on the factor used to determine the Option C benefit at retirement. For members who retired prior to January 12, 1988, if the System has accepted Section 288 of Chapter 194 of the Acts of 1998 and the beneficiary pre-deceases the retiree, the benefit payable "pops up" to Option A in the same fashion. The Option C became available to accidental disability retirees on November 7, 1996.

### ALLOCATION OF PENSION COSTS

If a member's total creditable service was partly earned by employment in more than one retirement system, the cost of the "pension portion" is allocated between the different systems pro rata based on the member's service within each retirement system. If a member received regular compensation concurrently from two or more systems on or after January 1, 2010, and was not vested in both systems as of January 1, 2010, such a pro-rata will not be undertaken. This is because such a person will receive a separate retirement allowance from each system.

## 11. GLOSSARY OF TERMS

### ACTUARIAL ACCRUED LIABILITY

That portion of the Actuarial Present Value of pension plan benefits which is not provided by future Normal Costs or employee contributions. It is the portion of the Actuarial Present Value attributable to service rendered as of the Valuation Date.

### ACTUARIAL ASSUMPTIONS

Assumptions, based upon past experience or standard tables, used to predict the occurrence of future events affecting the amount and duration of pension benefits, such as: mortality, withdrawal, disablement and retirement; changes in compensation; rates of investment earnings and asset appreciation or depreciation; and any other relevant items.

### ACTUARIAL COST METHOD (OR FUNDING METHOD)

A procedure for allocating the Actuarial Present Value of all past and future pension plan benefits to the Normal Cost and the Actuarial Accrued Liability.

### ACTUARIAL GAIN OR LOSS (OR EXPERIENCE GAIN OR LOSS)

A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between two Actuarial Valuation dates.

**Note:** The effect on the Accrued Liability and/or the Normal Cost resulting from changes in the Actuarial Assumptions, the Actuarial Cost Method, or pension plan provisions would be described as such, not as an Actuarial Gain (Loss).

### ACTUARIAL PRESENT VALUE

The dollar value on the valuation date of all benefits expected to be paid to current members based upon the Actuarial Assumptions and the terms of the Plan.

### AMORTIZATION PAYMENT

That portion of the pension plan appropriation which represents payments made to pay interest on and the reduction of the Unfunded Accrued Liability.

## 11. GLOSSARY OF TERMS *(continued)*

### ANNUAL STATEMENT

The statement submitted to PERAC each year that describes the asset holdings and Fund balances as of December 31 and the transactions during the calendar year that affected the financial condition of the retirement system.

### ANNUITY RESERVE FUND

The fund into which total accumulated deductions, including interest, is transferred at the time a member retires, and from which annuity payments are made.

### ANNUITY SAVINGS FUND

The fund in which employee contributions plus interest credited are held for active members and for former members who have not withdrawn their contributions and are not yet receiving a benefit (inactive members).

### ASSETS

The value of securities as described in Section VIII.

### COST OF BENEFITS

The estimated payment from the pension system for benefits for the fiscal year. This was the minimum amount payable during the first six years of some funding schedules.

### FUNDING SCHEDULE

The schedule based upon the most recently approved actuarial valuation which sets forth the amount which would be appropriated to the pension system in accordance with Section 22(6A), Section 22D or Section 22F of M.G.L. Chapter 32.

### GASB

Governmental Accounting Standards Board

## 11. GLOSSARY OF TERMS *(continued)*

### NORMAL COST

Total Normal Cost is that portion of the Actuarial Present Value of pension plan benefits, which is to be paid in a single fiscal year. The Employee Normal Cost is the amount of the expected employee contributions for the fiscal year. The Employer Normal Cost is the difference between the Total Normal Cost and the Employee Normal Cost.

### PENSION FUND

The fund into which appropriation amounts as determined by PERAC are paid and from which pension benefits are paid.

### PENSION RESERVE FUND

The fund which shall be credited with all amounts set aside by a system for the purpose of establishing a reserve to meet future pension liabilities. These amounts would include excess interest earnings.

### SPECIAL FUND FOR MILITARY SERVICE CREDIT

The fund which is credited with amounts paid by the retirement board equal to the amount which would have been contributed by a member during a military leave of absence as if the member had remained in active service of the retirement board. In the event of retirement or a non-job related death, such amount is transferred to the Annuity Reserve Fund. In the event of termination prior to retirement or death, such amount shall be transferred to the Pension Fund.

### UNFUNDED ACCRUED LIABILITY

The excess of the Actuarial Accrued Liability over the Assets.







**PUBLIC EMPLOYEE RETIREMENT ADMINISTRATION COMMISSION**

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